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HOW TO GROW MUSHROOMS.

BY

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UNDER THE SUPERVISION OF THE DIVISION OF VEGETABLE PHYSIOLOGY AND PATHOLOGY.

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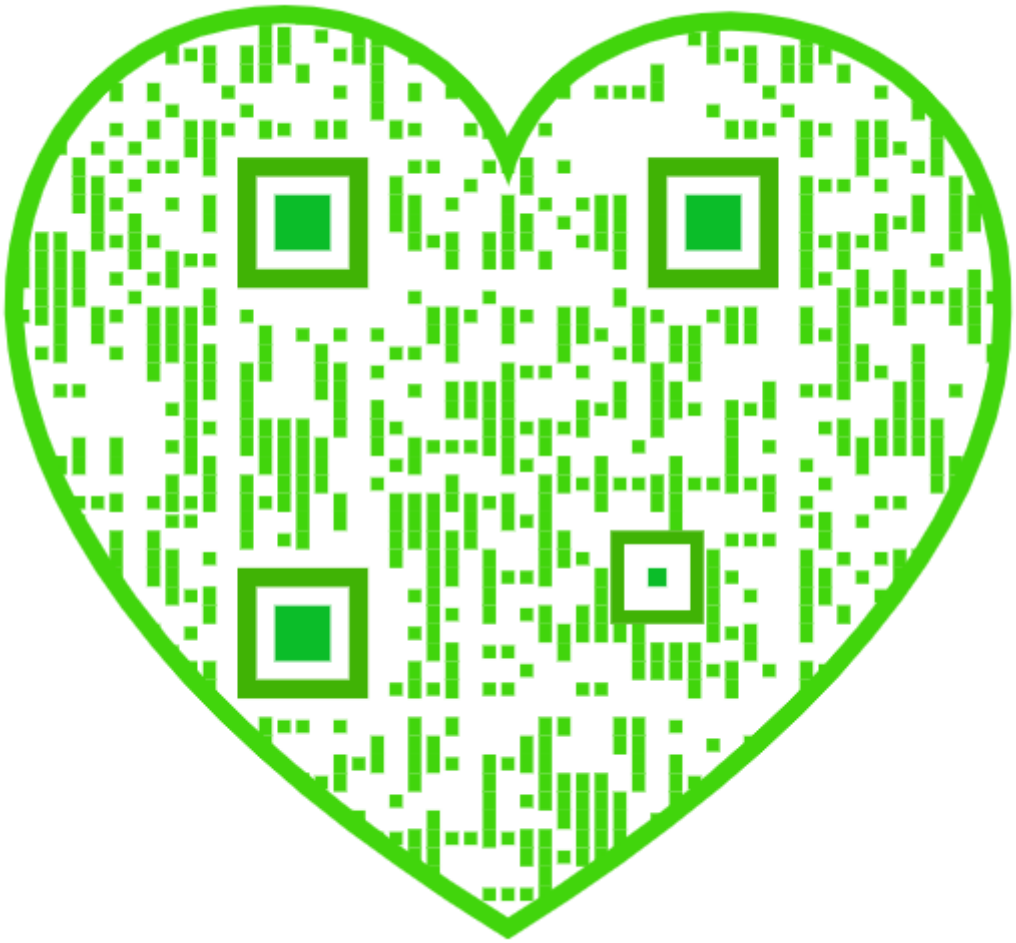

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HOW TO GROW MUSHROOMS.

INTRODUCTION.

The mushroom in commerce is practically the fruit of the mushroom plant, and not the plant itself, as some might be led to believe. The plant proper is a white or bluish white mold, called mycelium, or, in garden language, spawn, that grows in fields and manure piles. In its younger stage it becomes a network of white threads, and it is from the joints on these threads that the mushrooms spring. In growing the crop, therefore, it is important to keep the mycelium, or spawn, alive and spreading, and where this is done the production of mushrooms is sure to follow.

Mushrooms are a winter crop, coming in from September till April or May—that is, the work of preparing the manure begins in September and ends in February, and the packing of the crop begins in October or November and ends in May. Under extraordinary conditions the season may begin earlier and last longer, and in fact it may continue all summer.

Mushrooms are easy to grow and beginners are often as successful with them as are those having an extensive experience. Success depends upon general conditions, good materials, interest in the business, intelligent management, and persistent application. However, all these conditions are just as necessary in the successful and profitable raising of sheep, poultry, fruit, grain, or garden truck as they are in the mushroom industry. Aside from preparing the manure and making up the beds, it is a clean crop to handle and occupies little space, and so far as the general routine attention required by the beds and the gathering, sorting, packing, and marketing of the mushrooms are concerned, the women of the household can do the work as well as the men.

There is a widespread impression that there is some secret in the cultivation of mushrooms, that the whole procedure is shrouded in mystery, and that the mushrooms have even to be grown in midnight darkness; but this is a mistaken idea. True, many mushroom growers do much to foster this impression by carefully withholding all information as to their methods of growing the crop and persistently refusing to open their doors to anyone.

RAISING MUSHROOMS FROM SPORES, OR SEED.

The dark-colored powder produced in great quantity and diffused from the gills of the mature mushroom is what is called spores. These are in a way equivalent to the seeds of higher plants. But raising

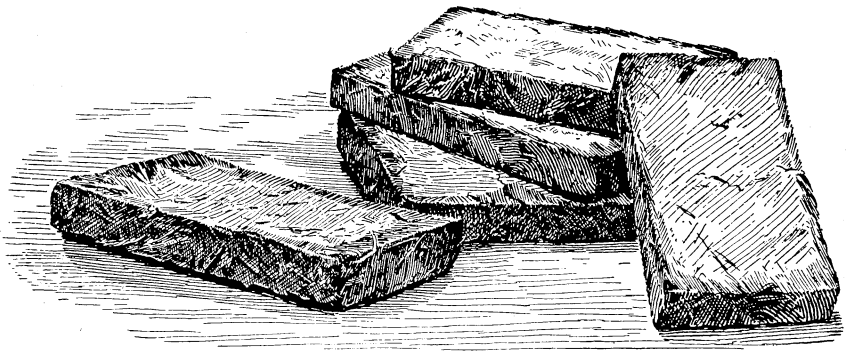

FIG. 1.—English, or brick spawn.

mushrooms from spores, or seed, is nature's business. In artificial cultivation they are never grown in this way, but instead are propagated from pieces of living spawn.

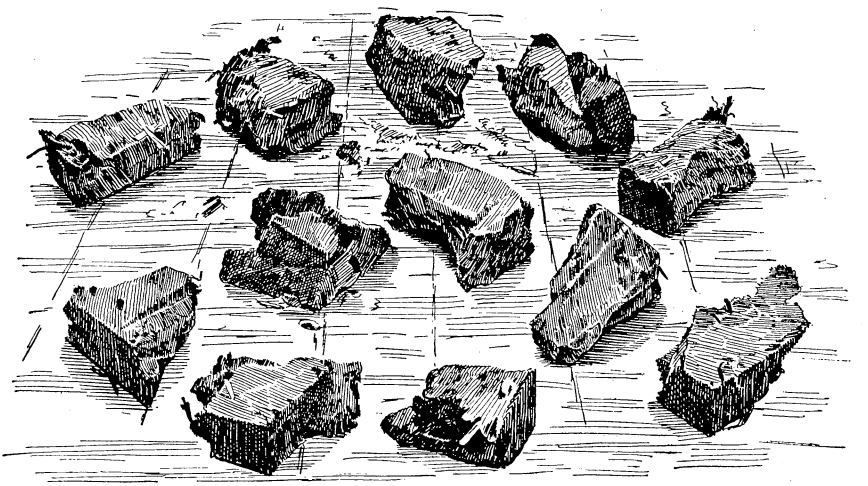

FIG. 2.—Brick broken into pieces ready for planting.

SPAWN.

As the underground stems of the blackberry and raspberry are cut into pieces and these planted to raise young plants, as the farmer chops up Bermuda grass "roots" and sows them to raise sod, or as the roots of the pestiferous bindweed are broken up into small pieces and scattered on the ground and every piece grows a plant, so if a lump of spawn

is broken into several pieces and these pieces planted, each will, under favorable conditions, start into new life, spread, and eventually produce mushrooms.

Only two kinds of spawn are in general use by our mushroom growers, namely, English brick and French flake, both of which are imported.

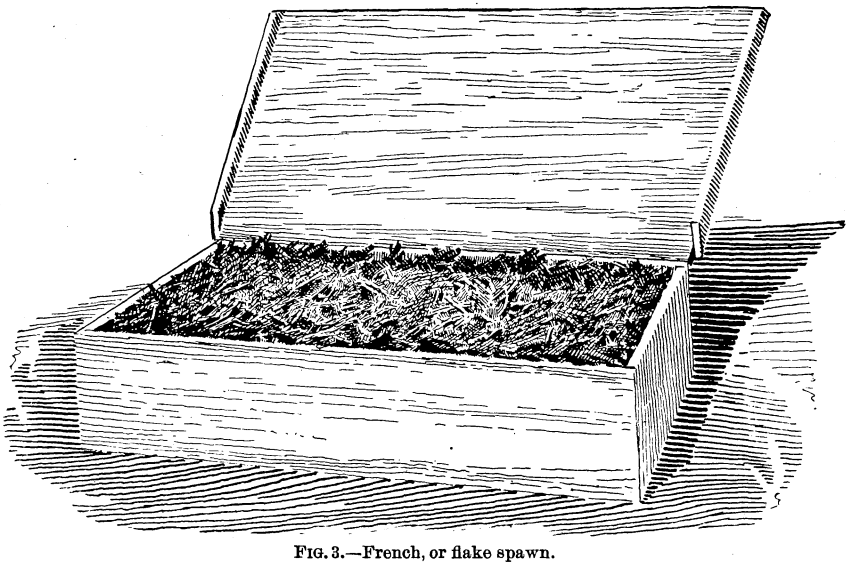

FIG. 3.—French, or flake spawn.

One of our largest market growers, however, uses natural spawn, but as yet there is no good homemade marketable spawn. The English brick spawn is put up in bricks of dry dust manure (fig. 1). The bricks measure about $8\frac{3}{4}$ by $5\frac{5}{8}$ by $1\frac{5}{8}$ inches and weigh 1 pound $4\frac{1}{4}$ ounces.

FIG. 4.—Flake broken into pieces ready for planting.

The manure in the brick has no virtue of itself, but is simply the host for the white spawn, hence the more spawn in the brick the better and more potent it is. The bricks are not planted whole, but each one is first broken into about twelve or fifteen pieces (fig. 2). The French flake spawn is imported in flakes of dry, strawy horse manure, either loose in

bulk, or, more commonly, in 3-pound boxes (fig. 3). As a rule, the flakes consist of a mass of white mycelium and show far more spawn than is seen in the bricks. The flakes are broken into pieces about 2 or 3 inches square (fig. 4) and are planted in the same way as the lumps of brick spawn. Many growers have from time to time tried to make their own spawn, and with more or less success, but at no time has an article been made which for good appearance and evenness was equal to the imported bricks. So far as known to the writer, the home manufacture of spawn has been entirely discontinued.

Spawn is kept in stock by all prominent seed stores and is advertised in seed catalogues. The price of brick spawn varies from 10 to 12 cents a pound in small lots, or $7 to $8 per hundred pounds, according to the quantity purchased. French, or flake, spawn costs about 30 to 35 cents a pound in bulk and 35 to 40 cents a pound in boxes. About 320,000

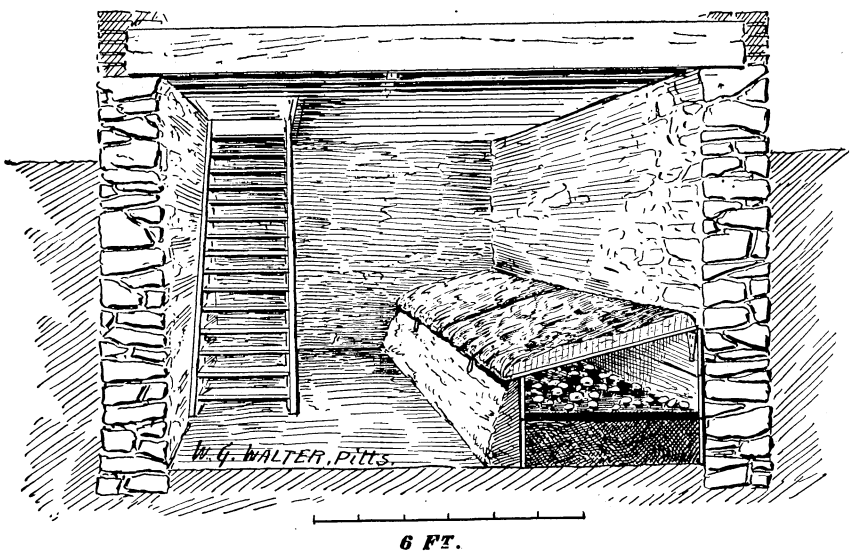

FIG. 5.—Mushroom bed in cool cellar.

pounds of brick spawn are now annually imported by our seedsmen. Six years ago the import amounted to only 64,000 pounds. This shows that mushroom growing has increased fivefold since 1890.

WHERE TO GROW MUSHROOMS.

Mushrooms can be grown almost anywhere out of doors, and also indoors where there is a dry bottom on which to set the beds, where a uniform and moderate temperature can be maintained, and where the beds can be protected from wet overhead, and from winds, drought, and direct sunshine. To grow mushrooms for profit, they should be cultivated only under the most favorable circumstances. Where the conditions or materials are in the least unfavorable the crop should be let

alone. Among the most desirable places in which to grow mushrooms are barns, cellars, closed tunnels, sheds, pits, greenhouses, and regular mushroom houses. Total darkness is not imperative, for mushrooms grow well in open light if shaded from sunshine. The temperature and moisture are more apt to be equable in dark places than in open, light ones, and it is largely for this reason that mushroom houses are kept dark.

A cellar is an excellent place in which to grow mushrooms. If the floor is free from water, it matters not whether it is made of cement or of wood. The windows and doors should be closed up and darkened. In case only a part of the cellar is devoted to the beds, this part should be partitioned off with cheap boards, or if that is impracticable the beds themselves may be covered over with mats, straw, etc., or may be

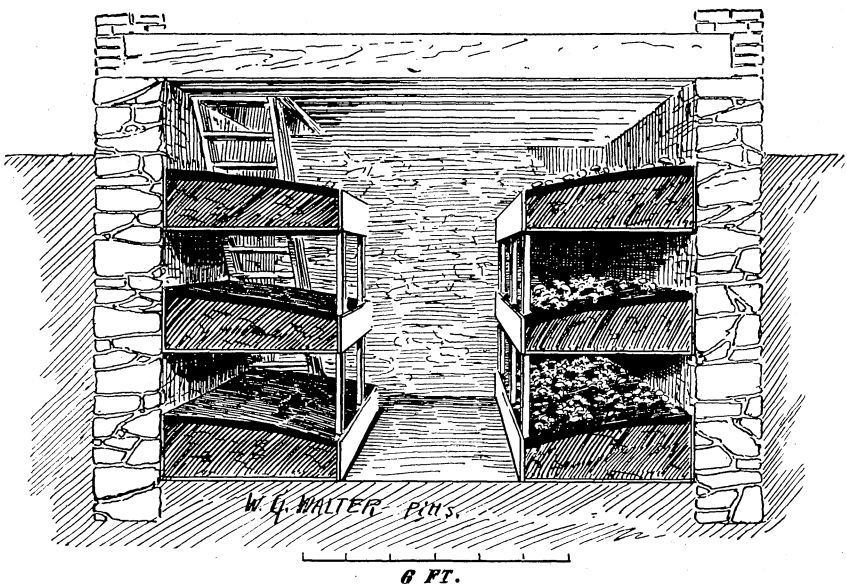

FIG. 6.—Shelf beds in warm cellar.

boarded up (fig. 5). If the cellar is not heated, the beds should be built on the floor only, and should be 14 inches deep. If the cellar is heated, besides the beds on the floor, shelf beds 8 to 10 inches deep may be used (fig. 6). In the case of a cool cellar, a warm shed, or a tunnel being given up altogether to mushrooms, it is not an uncommon way to spread the beds, or bed rather, all over the floor (fig. 7), with a path one board wide raised over the bed, as shown in the illustration.

A cave or a tunnel is practically the same as a cellar, except that these are seldom artificially heated. For this reason the beds are seldom in raised shelves, but are nearly always built on the floor. With beds built in this way and a good dry bottom, caves or tunnels make excellent places in which to grow the crop. A mushroom house

is generally a wooden building or shed built above ground or partly sunk, and fitted up for the purpose of growing this crop. Any house or barn-like shed that can be kept tight, warm (56° F.), moderately moist (without being musty), and dry should make a good place in

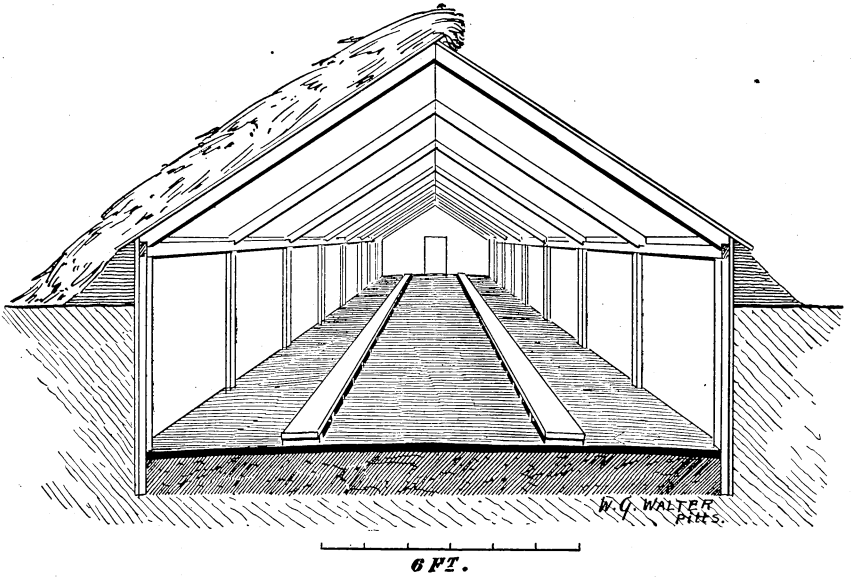

FIG. 7.—Board bed on floor of cellar or shed.

which to grow mushrooms. Figures 8 and 9 are good illustrations of the proper kind of mushroom houses.

The empty spaces under the benches in greenhouses are good places for mushroom beds, and as very little else can be grown therein, by planting to this crop space is utilized that would otherwise go to waste. Many florists grow mushrooms extensively in this way. A pit,

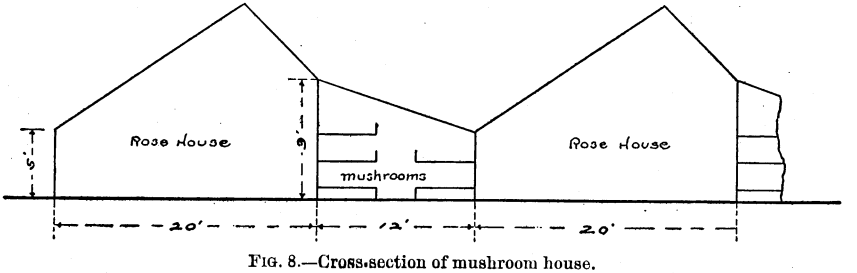

FIG. 8.—Cross-section of mushroom house.

such as a sunken frame, if it can be kept dry at the bottom and sides, makes a fairly good place for mushrooms. There must be a deep bed of manure, however, and the place should be covered over with shutters to keep an even temperature.

MANURE.

The best fertilizer for mushrooms, so far as the writer's experience goes, is fresh horse manure. Get together a lot of this material (short and strawy) that has been well trampled and wetted in the stable. Throw it into a heap, wet it well if it is at all dry, and let it heat. When it begins to steam turn it over, shake it well so as to mix thoroughly and evenly, and then tramp it down solid. After this let it stand till it again gets quite warm, then turn, shake, trample as before, and add water freely if it is getting dry. Repeat this turning, moistening, and trampling as often as is needful to keep the manure from "burning." If it gets intensely hot, spread it out to cool, after which again throw it together. After being turned in this way several times and the heat in it is not apt to rise above 130° F., it should be ready to make up in the beds. By adding to the manure at the second

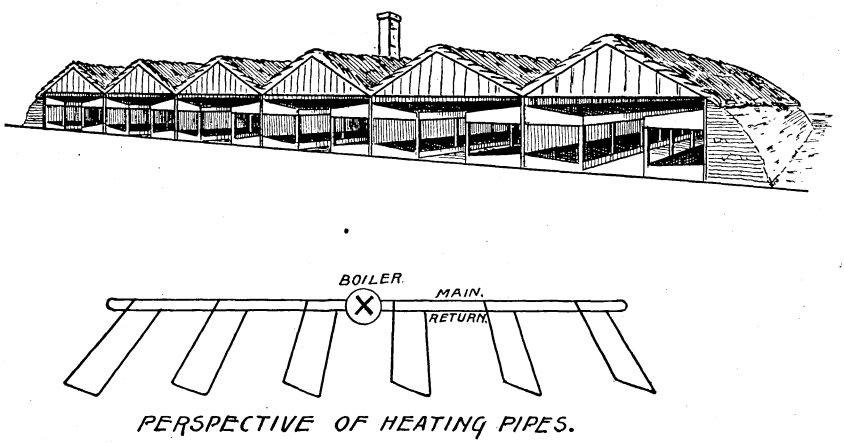

FIG. 9.—Mushroom houses showing heating arrangement.

or third turning one-fourth or one-fifth of its bulk of loam the tendency to intense heating is lessened and its usefulness not at all impaired. Some growers prefer short manure exclusively, that is, the horse droppings, while others like a good deal of straw mixed in with this. The writer's experience, however, is that if properly prepared it matters little which is used.

Manure from animals fed with hard food, such as hay and grain, is best. Where carrots and such crops are fed the manure is apt to prove injurious. City stable manure is what most of the large mushroom growers use. Some of them haul it home from the cities in wagons, while others get it in car loads or boat loads. If the manure can be placed under cover of a shed, away from wind and wet, and there turned, it will be better in every way than if kept out in the open air. Manure from cows fed with dry feed if mixed with horse manure is excellent for mushroom beds. One-fourth cow manure and three-fourths horse

manure mixed and heated together from the first has given the writer fine mushrooms. When rotted sod loam, to the amount of one-fourth of the whole bulk, was added to the pile it was better still, as it heated less, was sooner ready for building, and the beds lasted longer than those made of plain manure.

In gathering or saving manure for this crop it is not necessary that it should all be of the same age. If it is fresh and has good heating life it will answer even if some of it is two or three months old.

PREPARING THE BEDS.

If the beds are to be made on the floor, the latter should be dry. If the house or cellar is cool and unheated, the bed should be 14 to 16 inches deep. If stove, hot water, or steam heat can be used, a depth of 12 inches will answer, but 14 inches is better. Measure off the floor space in long strips. These should be 3 or 4 feet wide at the sides, and 4, 5, or 6 feet wide in the middle, with spaces 2 or 2½ feet wide for pathways between them. If there are to be shelf beds over the bottom beds, the pathways should be 2½ to 3 feet wide to admit of wheeling a barrow over them, as this will be necessary in taking the manure in and out. In the bottom of the beds place a 6 inch layer of well-moistened hot manure from the ordinary stable pile and trample it firm. In a few days after, when it has cooled off somewhat, fill up the bed with the manure specially prepared for the mushrooms, shaking it on in layers 1 or 2 inches thick, and trample down firm. If there is a probability of its heating intensely, put on only one or two layers a day, strew some loam between them, and raise the manure a little with the fork so that the earth may sift down through it. When the bed is made up, strew a little straw or hay over it to arrest the moisture from the condensed steam. If this is not done, the surface of the bed is apt to get rather wet. The straw should be left on until the bed is ready for spawning, after which it should be removed.

Ordinarily the beds are only 8 to 10 inches deep, that is, they are faced with 10-inch-wide hemlock boards (fig. 6), and are only the depth of this board. In such beds put in a layer of fresh, moist, hot manure and trample it down firm until it constitutes half the depth of the bed; then fill up with the prepared manure, which should be rather cool (100° to 115° F.) when used, and pack all firm. If desired, the beds can be made up entirely of the prepared manure. Shelf beds are usually 9 inches deep, that is, the shelf is bottomed with 1-inch boards and faced with 10-inch-wide boards. This allows about 8 inches for manure and 1 inch rising to 2 inches of loam on top. In filling the shelf beds the bottom half may be of fresh, moist or wettish, hot manure, packed down solid, and the top half of rather cool prepared manure, or it may be made up of all prepared manure. As the shelf beds can not be trodden and can not be beaten very firm with the back of the fork, a brick is used in addition to the fork.

SPAWNING THE BEDS.

The beds should be spawned after the heat in them has fallen below 100° F. The writer considers 90° F. about the best temperature for spawning. If the beds have been covered with hay, straw, litter, or mats, these should be removed. Break each brick into twelve or fifteen pieces, as shown in fig. 2. The rows should be, say, 1 foot apart, the first one being 6 inches from the edge, and the pieces should be 9 inches apart in the row. Commencing with the first row, lift up each piece, raise 2 to 3 inches of the manure with the hand, and into this hole place the piece, covering over tight with the manure. When the entire bed is spawned pack the surface all over. It is well to cover the beds again with straw, hay, or mats to keep the surface equally moist. The flake spawn is planted in the same way as the brick spawn, only not quite so deep.

LOAMING THE BEDS.

At the end of eight or nine days the mulching should be removed and the beds covered with a layer of good loam 2 inches thick, so that the mushrooms can come up in and through it. This gives them a firm hold and to a large extent improves their quality and texture. Any fair loam will do. That from an ordinary field, wayside, or garden is generally used, and it answers admirably. There exists an idea that garden soil surfeited with old manure is unfit for mushroom beds because it is apt to produce spurious fungi. This, however, is not the case. In fact, it is the earth most commonly used. For molding the beds the loam should be rather fine, free, and mellow, so that it can be easily and evenly spread and compacted firmly into the manure.

TEMPERATURE.

An atmospheric temperature of 55° F. brings fine, solid, short-stemmed mushrooms, and in this temperature the beds bear longer. A temperature of 60° F. is good. It brings the crop in a little earlier than 50° F., but exhausts it sooner. A temperature of 65° F. is too warm. Although mushrooms appear to thrive in it, they are rather thin, drawn, and short lived. Fifty degrees will do, but the crop in this temperature is slow in bearing. If the temperature in the cellar or mushroom house is apt to run higher than 60° F., some means must be devised for keeping it reduced. Should it fall below 50° F., it must be raised artificially either by covering the beds or by heating the place they are in by hot water, steam, or a stove. Between the time of spawning and the first appearance of the mushrooms a temperature of 65° or 70° F. may be maintained with beneficial effects in causing the spawn to spread, but after the crop appears the heat should never be allowed to go higher than 55° to 60° F.

If an even atmospheric temperature of from 55° to 60° F. can be maintained, and the house or cellar containing the mushroom beds is kept

close and free from drafts, the beds may be left uncovered and should be watered if they become dry. But no matter where the beds are situated it is well to lay some loose hay or straw or some old matting or carpet over them to keep them moist. The covering, however, as before stated, should be removed just as soon as the young mushrooms begin to appear above ground. If the atmosphere is dry, the pathways and walls should be sprinkled with water. The mulching should also be sprinkled, but not enough to cause the water to soak into the bed. However, if the bed should get dry, do not hesitate to water it.

GATHERING THE MUSHROOMS.

Go over the beds every day and if there are many beds twice a day, and pick every mushroom that is large enough for market. Lay them in a single layer in trays, flats, or baskets, then take them outside to a cool shed or room. In picking do not cut the mushroom off at the root, but catch it by the top and give it a gentle twist or bend and it will come away from the ground quite easily. In this way no butts are left in the ground to rot and transmit disease to other mushrooms.

It sometimes happens that the mushrooms come up in solid cakes of about five, ten, or perhaps as many as fifty. To twist a few out of the clump would unfasten it and completely stop the further growth of those remaining. In such cases the mushrooms must be cut at the base, and a few days later, or just as soon as the clumps are gathered, the butt ends should be rooted out and the hole filled with a little fresh loam. In gathering never pile the mushrooms one on top of the other, because the dirt from the butt ends is apt to fall on the tops and give them a soiled appearance, and if the caps are burst open and the dirt falls in among the gills it spoils the mushrooms and lowers the standard of the brand.

Do not delay gathering mature mushrooms until others have reached this stage, but whenever one is large enough pick it. If allowed to remain longer or until a few more are ready to pick, it will burst open, and that means deterioration in quality and appearance. If picked young and kept cool, dry, dark, and close, mushrooms will remain pretty, plump, and white for two days.

SORTING.

In gathering mushrooms everyone that is big or old enough, whether good, bad, or indifferent, should be taken, for to leave them longer would be to spoil the bed. In sorting these for market, however, take only those which are good and throw away the remainder. Never send a poor, old, small, drawn, or wormy mushroom to market. Where a grower makes a practice of putting in his baskets only first-class mushrooms, and putting them up firmly, neatly, tastefully, and cleanly, he will have no difficulty in disposing of them. His commission agent, knowing the character of his baskets and having perfect confidence in

his honesty, will ship them to the first order. It will not be necessary in such cases for him to open the baskets to know what is in them. This saves him trouble, time, and expense, and he can guarantee satisfaction to his customers. On the contrary, where a grower puts all kinds of mushrooms in his basket—big and little, good, solid, white-headed ones, and flat, open, black-gilled ones, those with long, thin stems, and those with ugly, gouty ones—the commission agent has to sort them over and will keep and pay only for what is good. Moreover, as mushrooms will not bear much handling without considerable breakage and discoloration, and hence deterioration, it is far better and more profitable for the grower to sort them at home.

PACKING.

Having sorted the mushrooms, that is, thrown out everything that is worthless, they should be again looked over before packing. If the stems are long, shorten them half their length; if medium, cut off the butt ends; and if very stocky and short-stemmed, rub the butts over so as to clean them perfectly from dirt or discoloration. Brush off any earth, straw, dirt of any kind, or flies that may have stuck to the caps. Now line the boxes or baskets with clean, white, cheap paper, and lay the mushrooms in gently and compactly. One, 3, or 5 pound baskets, if long or wide rather than deep, may be filled up solidly and covered with white paper, and then all covered over with manila paper. These baskets can be shipped singly or in crates to the commission agents, and by them, without disturbing the contents, to their customers. The sizes of baskets mentioned are the most convenient for sending to private customers.

When a grower carries his mushrooms to market, he may, for convenience, put them into large baskets, but they will probably have to be handled again by the commission man. For packing purposes boxes are not as good as baskets, for mushrooms soon spoil in tight cases, owing to lack of air. Never pack them when they are damp and never keep them in warm quarters.

The following statement, dated January 18, 1897, is from one of the largest commission houses in the country, and will give some idea as to how this crop should be handled, prices, etc.:

The demand for mushrooms is increasing every year. The supply is also increasing, so much so, in fact, that since the holidays mushrooms of poor quality have been a drug on the market and almost unsalable. As to the average price, there is really none. Prices vary according to the supply and demand, and according to the quality of the mushrooms. The finest quality of mushrooms (fig. 12) that comes to this market [New York City] sell here at 50 cents per pound. Now we have others that sell for 40 cents, 30 cents, and even as low as 10 cents per pound. For those that sell so very low, a market is being found among a poorer class of people. Still the supply is so great that we think if all the mushrooms sent to the market were first quality they would probably not bring over 25 cents per pound.

The advice we give growers is to ship nothing but the best mushrooms, as poor ones are generally a drug on the market, even when the best are in good demand.

We also advise them never to ship anything that is old. Mushrooms shrink more than anything else that we handle. In warm weather we have known of 7-pound baskets to shrink one-half to three-fourths of a pound each from the time they were

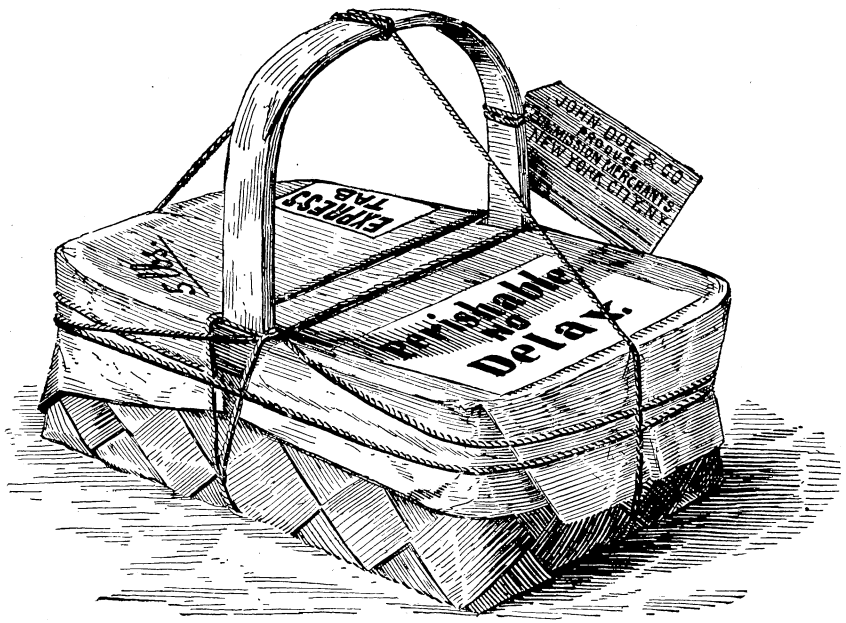

FIG. 10.—Basket of mushrooms from leading commission house.

FIG. 11.—Basket shown in fig. 10 when opened.

shipped on Saturday morning till we were able to put them on the market Monday morning. Fig. 10 is a very good illustration of the way mushrooms should be packed. However, we should prefer having the inside of the basket lined with

newspaper and the top covered with manila paper. Mushrooms stand a great deal of cold. We have never yet had any so badly frozen that they were unsalable. Very often they will be found to be moist, as though wet. This moisture does not appear to be water, but is a sort of oil, which does not freeze.

The basket shown in fig. 10 is one received from the firm above quoted. Fig. 11 shows it when opened, and fig. 12 shows some of the mushrooms that were in it. The basket was lined with paper, the mushrooms were select specimens and were packed firmly, and the outer covering was moderately heavy manila paper. The string tied around the basket and up over the handle prevents other express packages from being laid on top of the mushrooms. The express charges were 40 cents from New York to Pittsburg and 15 cents for delivering, in all 55 cents.

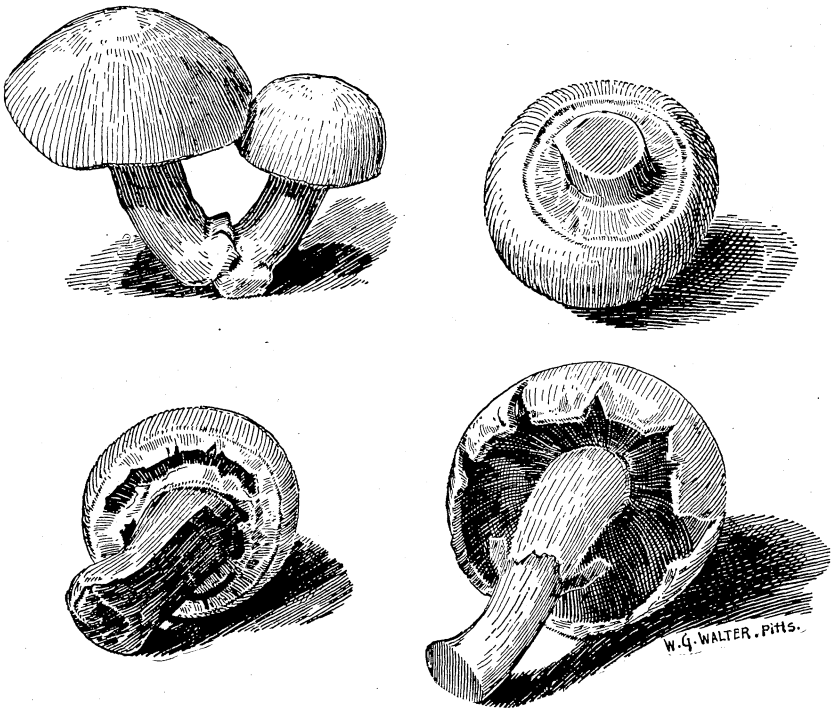

FIG. 12.—Mushrooms from basket shown in fig. 10.

One of the largest and most successful growers in the country sent the writer a basket of mushrooms and detailed his methods of packing.

Fig. 13 shows the basket as received and fig. 14 as it appeared when opened. It was a most tasteful example of packing mushrooms for market or distant shipment. The basket was of common cheap chip. It was lined with blue tissue paper, and the mushrooms, every one of which was fresh, plump, and solid, and gathered just before the veil broke, were packed most carefully and as solidly as apples in a barrel, but were not crushed. Around the sides and over the top of

the basket a sheet of waxed paper was laid, the outer wrapper being manila paper. The express charges on it were 70 cents—15 cents from Long Island to New York, 40 cents from New York to Pittsburg, and 15 cents for delivering. In a letter dated February 9, 1897, the gentleman who shipped the basket writes as follows:

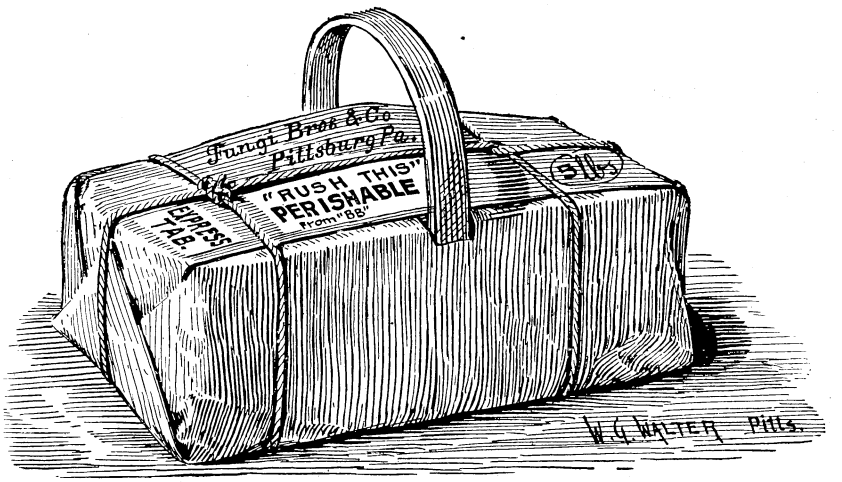

FIG. 13.—Basket from a large mushroom grower.

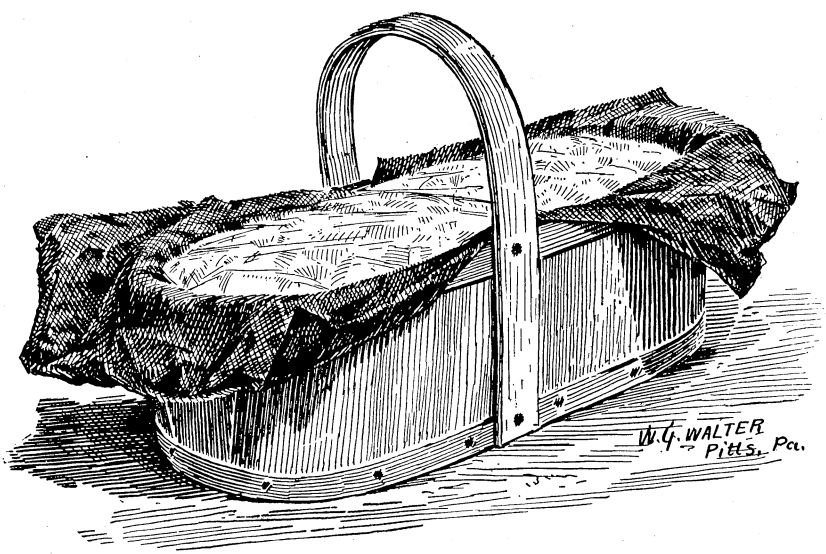

FIG. 14.—Basket shown in fig. 13 when opened.

"The prices for mushrooms range from 25 to 35 cents a pound, though I get 40 cents or more from my commission man, who writes me to-day that mine bring extra prices always."

MARKETING.

The grower who can furnish a constant supply of No. 1 fresh mushrooms, put up in first-class style, can market them in several ways, to wit, consign them to a commission merchant, or sell them to hotels, restaurants, retail fruiteries, or private parties. Most growers consign direct to the commission agents. Where the agents can depend on a grower for a supply of first-class mushrooms on certain days this grower can always sell for the highest market price. But if the mushrooms are mixed and not particularly good, and the supply is uncertain, the agent has more difficulty in disposing of them, and they bring a low price.

Hotel trade has to be drummed up. The call generally is for so many pounds a week at a certain price. Any failure in supply or quality cancels the contract. Retail trade—that is, selling direct to the high-class fruit stores—is subject to the same conditions as hotel trade. Private trade is very uncertain and has to be drummed up.

A few years ago the supply of mushrooms was so limited that high prices ruled. Nowadays, however, the supply has increased to such an extent that prices have fallen accordingly. At present it is easy enough to grow mushrooms; the difficulty is to create a greater demand for them. Think of the immense quantity of canned mushrooms that are imported into this country and how tough and tasteless they are when compared to fresh, home-grown ones. Cleaner handling, gathering the mushrooms younger than has been the custom, and selecting, sorting, and packing them more carefully than is generally done will help matters a little. Much can also be done for mushroom growing by spreading a knowledge of the industry and a liking for the mushrooms among the middle classes.

RENOVATING OLD OR FAILING BEDS.

This can be done to a certain extent, but for commercial purposes it hardly pays. As soon as a bed has ceased to yield a fair crop, it is better to throw it out altogether and start in with a new one. To stimulate an old bed, rub off any dirt or old roots that may be on the surface, top-dress it with a fresh layer of loam an inch deep, and give the whole a good soaking of tepid manure water (this water is usually prepared by dumping a bushel of fresh horse droppings into a barrel of water and letting it soak there overnight).

MUSHROOM DISEASES.

The diseases of mushrooms are generally known as fogging off, flock, and black spot. Fogging off is a softening, wilting, and dying of the pin-head and other small mushrooms. This trouble shows itself in patches or clumps. The cause of the fogging off is the death or injury of the mycelium to which the mushrooms are attached, but what kills the spawn is still a mystery. When once affected with this trouble, there is no hope for the mushroom. The little soft ones should be rubbed

off and the spot top-dressed with clean, fresh loam, with a pinch of saltpeter in it.

Flock is a white mold that runs over the gills of the mushroom, welding them together into hard or flocky masses. It is not common, does not spread, and seldom appears on new beds. Although not poisonous, flocky mushrooms should not be eaten. There is no known cure for this disease.

Black spot appears as dark-colored spots or freckles on top of the cap of the mushrooms and is caused by a host of minute eel worms. This trouble seldom appears in beds while they are fresh. Rigid attention to all cultural details and cleanliness about the beds are, in a measure, preventives of these diseases.

INSECT AND OTHER ANIMAL ENEMIES.

Several insects attack or infest mushrooms, but maggots are the worst of all. These are the larvæ of *Phora agarici* Lintner, also of *Phora minuta*. They appear in April and continue all through the summer, perforating and tunneling the caps and the stems of the mushrooms. It is because of these pests that mushroom growing is discontinued in summer, except in caves. There is no practical way of preventing these and at the same time permitting the crop to be grown at a profit.

Manure flies (*Sciara coprophila* Lintner), which may swarm in thousands in the cellar from February on, are not, so far as known to the writer, injurious to mushrooms. Different mites (at least two species, if not genera) have also been found by the writer infesting wounds or cracks in mushrooms, especially in the stems, but they are the effect, not the cause, of the wounds. Neither the manure flies nor the mites are worth considering as mushroom pests, and are only mentioned because they often appear in great numbers and their presence might cause alarm.

Several slugs prey on mushrooms, eating holes in their caps or gills. One species eats a hole clear through the cap. The way to deal with these slugs is to take a lantern at night, search them out, and kill them, or lay pieces of dry, decayed boards here and there about the beds as traps. Two pieces hollowed a little and placed one above the other make a good trap. A teaspoonful of bran, with a little paris green mixed in it and laid on a thin piece of dry, decaying wood, is a good but a dangerous insecticide.

Wood lice, or sow bugs, are also injurious. They abound wherever they can find a nice, dry spot for shelter, and especially where there is hay or straw. Rigid cleanliness about the bed is recommended. The writer uses little covered pasteboard boxes, open at one end. Into these is placed a piece of half-boiled potato and about it some perfectly dry dead moss. The sow bugs go into the box to eat the potato and enjoy the hiding place afforded by the moss. The boxes should be picked up every morning and the bugs shaken into a can partly filled with kerosene.

GROWING MUSHROOMS IN SUMMER.

In cellars, ordinary mushroom houses, greenhouses, or pits, the mushroom season, as already pointed out, is the winter and early spring, that is, from October to May. They can not be grown in these places in summer on account of the maggots. Where it is desired to grow good, clean mushrooms during the summer months, the beds must be placed deep underground, where the little flies can not find an entrance. Caves or mines can sometimes be utilized for this purpose. In such places the crop in summer would doubtless prove profitable, provided there is a good market near by and the shipping facilities are not faulty.

[NOTE.—The subject of mushrooms will be further treated in a bulletin to be issued in a few months, which will be devoted to descriptions of edible and poisonous species, with special reference to their identification.]

FARMERS' BULLETINS.

These bulletins are sent free of charge to any address upon application to the Secretary of Agriculture, Washington, D. C. Only the following are available for distribution:

No. 15. Some Destructive Potato Diseases: What They Are and How to Prevent Them. Pp. 8.
No. 16. Leguminous Plants for Green Manuring and for Feeding. Pp. 24.
No. 18. Forage Plants for the South. Pp. 30.
No. 19. Important Insecticides: Directions for Their Preparation and Use. Pp. 20.
No. 21. Barnyard Manure. Pp. 32.
No. 22. Feeding Farm Animals. Pp. 32.
No. 23. Foods: Nutritive Value and Cost. Pp. 32.
No. 24. Hog Cholera and Swine Plague. Pp. 16.
No. 25. Peanuts: Culture and Uses. Pp. 24.
No. 26. Sweet Potatoes: Culture and Uses. Pp. 30.
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No. 59. Bee Keeping. Pp. 32.
No. 60. Methods of Curing Tobacco. Pp. 16.
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No. 79. Experiment Station Work—VI. Pp. 28.
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No. 84. Experiment Station Work—VII. Pp. 32.
No. 85. Fish as Food. Pp. 30.
No. 86. Thirty Poisonous Plants. Pp. 32.
No. 87. Experiment Station Work—VIII. (In press.)
No. 88. Alkali Lands. (In press.)
No. 89. Cowpeas. (In press.)